

SOILS INTERPRETATION HELP SHEET (Revised 2005)

Figure 10.6 - Determining available water capacity (AWC)

Field Procedure for Estimating Available Water Capacity

1. Identify the horizons present in the soil profile.
2. Measure the thickness of each horizon.
3. Determine the effective depth of rooting.
4. For each horizon:
 - a. Determine the texture and the rock fragment (2 mm-25cm) content.
 - b. Find the percent fine earth by subtracting:
100% - percentage rock fragment content = percent fine earth.
 - c. Use the AWC rate that corresponds to the texture of each horizon.
 - d. Multiply the AWC rate by thickness of horizon by percent fine earth to determine the AWC.
5. Total the AWC for all horizons within the effective rooting depth.
6. Determine the correct AWC class.

Soil Texture	AWC Rate in Inches of Water/Inch of Soil	AWC Class (Rates to 60 in.)
Sand, loamy sand	.06	Very low -- < 3 in.
Sandy loam	.12	Low -- 3 - 6 in.
Loam, silt loam	.22	Moderate -- 6 - 9 in.
Silty clay loam, clay loam	.17	High -- 9 - 12 in.
Silty clay, sandy clay	.12	Very high -- 12 in.
Sandy clay loam	.15	
Clay	.09	

Table 10.5 - Guide for Internal Drainage and Depth to WT

Drainage Class	Mottles
Excessive (E)/ Somewhat excessive (SE)	No gray colors or mottles within 72 in.
Well (W)	Gray mottles below a depth of 42 in.
Moderately well (MW)	Gray mottles at depths of 24-42 in.
Somewhat poorly (SP)	Gray mottles below the A horizon at depths of 12-24 in.
Poorly (P)	Gray mottles in and below the A horizon or at a depth of 0 – 12 in.
Very poorly (VP)	Gleyed colors or gray mottles to the surface, depressional areas, and evidence of long periods of ponding above the surface.

Table 10.4 - Guide for Determining Soil Permeability

Texture	Permeability (inches of water/hour)
Sand, loamy sand	Rapid and very rapid (>6.0 in/hr)
Sandy loam	Moderately rapid (2.0 - 6.0 in/hr)
Loam, silt loam	Moderate (0.6 - 2.0 in/hr)
**** Sandy clay loam	Moderately slow (0.2 - 0.6 in/hr)
**** Clay loam, silty clay loam	Moderately slow (0.2 - 0.6 in/hr)
**** Sandy clay	Moderately slow (0.2 - 0.6 in/hr)
**** Silty clay, clay	Very slow and slow (< 0.2 in/hr)
NOTE: If the horizon is a fragipan, use the guide below. All fragipans will be "very slow" in permeability.	
	Slow (0.6 - 0.06 in/hr) Very slow (< 0.06 in/hr)
***NOTE: If the horizon is Kaolinite/Sandy clay loam; Clay loam, silty clay loam; Sandy clay; or Silty clay, clay use the Structure and Permeability to the right.	
	Moderate (0.6 - 2.0 in/hr)
	For subsoil permeability, use permeability of most limiting layer (between the base of the surface layer to a depth of 60 inches excluding the CR and R horizons).

Table 13.2 - Guide for Determining the Shrink-Swell Potential

Use thickest layer (10 to 60 inches) Dominant % of Material

Soil Texture	Percent Clay	Shrink-Swell Rating
Sand, loamy sand, sandy loam, loam, silt loam	0 - 26.99%	Low
** Silty clay loam, clay loam, sandy clay loam	27 - 39.99%	Moderate
*** Silty clay, clay, sandy clay	> 40%	High
** Kaolinite/Silty clay loam, clay loam, sandy clay loam use Low Shrink-Swell Rating		
*** Kaolinite/Silty clay, clay, sandy clay use Moderate Shrink-Swell Rating		

***Table 10.3 - Permeability Class**

Permeability Class	Water Flow in saturated soil (in/hr)
Very rapid	> 20.0
Rapid	6.0 - 20.0
Moderately rapid	2.0 - 6.0
Moderate	0.6 - 2.0
Moderately slow	0.2 - 0.6
Slow	0.06 - 0.2
Very slow	.01 - .06
Extremely slow	<0.01

Figures and Tables have been condensed and may not match the IML curriculum guide and student handbook.

Figure 12.1 - Guide for determining artificial surface drainage			Table 13.1 - Guide for Rating Limitations for Pond Reservoir Area For subsoil permeability, use permeability of most limiting layer.					
Drainage is needed for:			Property		Slight	Moderate	Severe	
1. Soils that are somewhat poorly drained, poorly drained or very poorly drained, and are nearly level with depressional spots.			Permeability		<0.6 in/hr	0.6 - 2.0 in/hr	>2.0 in/hr	
2. Sloping soils below seepy areas.			Depth to hard bedrock		> 60 in	20 - 60 in	< 20 in	
			Depth to soft bedrock		> 60 in	20 - 60 in	< 20 in	
			Slope		< 3%	3 - 8%	> 8%	
Table 12.1 Irrigation Guidelines			Table 13.3 - Guide for Rating Limitations for Dwellings with Basements					
Soil Characteristic		Asset	Liability	Property		Slight	Moderate	Severe
Surface Soil Texture		Loam, silt loam, silty clay loam, clay loam	All Other Textures	Depth to WT		> 6.0 ft	2.5 - 6.0 ft	< 2.5 ft
Slope		0 - 3%	> 3%	Flooding		None	---	Any flooding
AWC		> 6 in	0 - 6 in	Shrink-Swell (thickest layer 10-60 in)		Low	Moderate	High
Depth to High WT		> 2 ft	0 - 2 ft	Slope		< 8%	8 - 15%	> 15%
Permeability		> 0.2 in/hr	< 0.2 in/hr	Rock Fragments (percent >3 in)		< 15%	15 - 35%	> 35%
Rock Fragments >3 in (surface layer)		< 15%	> 15%	(avg. percent volume to a depth of 40 in)				
Depth		> 40 in	0 - 40 in	Depth to Bedrock		> 60 in	40 - 60 in	< 40 in
Table 12.2 - Guide for Determining Hazards or limitations for Cropping			Table 13.4 - Guide for Rating Limitations for Septic Tank Absorption Fields Use most limiting layer in (24-60 inches).					
Possible Hazard or limitation		Soil Characteristics That Indicate A Hazard or Limitation Exists						
Slope or Erosion		1. All land slopes longer than 90 ft in excess of 2% slope. 2. Any eroded area where the upper 6-7 in is either mixed topsoil and subsoil, mostly subsoil, or has gullies.						
Available Water Capacity		Less than 10 in of available water in the upper 60 in of the profile.						
Surface Drainage		High water table <2 ft and nearly level with depressional spots. Also, sloping areas below seep spots.						
Internal Drainage		High water table <3.5 ft.						
Rock Fragments (volume upper 10 in)		>15%						
Stoniness (surface)		Stones <100 ft apart						
Rockiness		10 sq. ft. of rock outcrop per 10,000 sq. ft. of area						

Figures and Tables have been condensed and may not match the IML curriculum guide and student handbook.